those cases, and practically nothing is known of its action on the human economy, especially when taken in the considerable doses that would be contained in the substances preserved by this proposed compound. So that it seems at least desirable that a little more inquiry should be made as to the physiological action of boron compounds before it is proposed as a wholesale preserver of food stuffs.

Of the other constituent of this compound something more is known. It exists naturally in many articles of food or drink, and its physiological action has been to a considerable extent investigated, and proved to be on the whole quite harmless.

As a preservative against fermentive or bacterial action, it has also been investigated more fully than boric acid.

In a concentrated condition it will resist both ordinary fermentation and the fermentation of various bacteria in a high degree.

As the compound $BO^3C_3H_5$ is decomposed into boric hydrate and glycerine on contact with water, it would scarcely appear that there is any advantage in forming the etherial compound.

It would appear indeed that all the preservative effects claimed for this ether can be obtained by the use of glycerine alone, thus excluding a possible source of danger in the use of a comparatively unknown substance (physiologically) like boric acid (see Kletzinsky, *Dingl. pol. J.*, 171, 370; Kunath, *ibid.*, 193, 439; Wagner, *Jahresb.*, 1868, 523; Fleck, *Dingl. pol. J.*, 196, 487).

NOTES

WE are pleased to learn that the Imperial Government has granted a sum of 2500*l*. (1500*l*. this year, and 1000*l*. next), and that the Canadian Government has further voted $4000 for a station for circumpolar observations.

IN the discussion on the New Code, on Monday night, in the House of Commons, Sir John Lubbock pointed out several of its weak points as regards the teaching of science. He complained that children of the fourth standard were excluded from specific subjects, and that, as at present worded, children who take class subjects, might never be taught any science at all, as one of them must be English, and another might be history. It would certainly be disappointing, if, after so much thought had been expended in drawing up the New Code, the evident desire of its framers to encourage science teaching should have been defeated. Mr. Maskelyne, Lord G. Hamilton, and others, while supporting Sir John Lubbock's criticisms, pointed out other defects, which, we hope, will have Mr. Mundella's attention. Indeed, he promised to take the suggestions made into consideration, and, we believe, that if he does so seriously, he will see it to be advisable so to frame the regulations as to class and special subjects as to secure that the elements of natural knowledge will have a chance of becoming a regular part of elementary education. The old bugbear attached to the name "elementary science," and to scientific terminology, was alluded to again, but that is a bugbear long ago dissolved, and not worth a moment's consideration; by all who have given the matter any attention, or who have had any experience in teaching, it is admitted that nothing is more interesting to children of all ages than "object lessons," *i.e.* practical instruction in science, and nothing more dreary and unprofitable than "grammar" as usually taught. Our New Code as it stands is a contrast, so far as science is concerned, to the Primary Education Act of France, which has just been promulgated. The Primary Education which is compulsory in France comprises "Moral and civil instruction, reading, writing, geography, history, some notions of law and political economy, the elements of natural, physical, and mathematical science, their applications to agriculture, health, industrial arts, manual labour, and the use of the tools of the principal crafts, the elements of drawing, modelling, and music, gymnastics, for boys military drill, for girls needlework." We shall doubtless reach this standard some day, and one step to it would be to make attendance at school compulsory on all up to the age of fourteen years.

DR. NACHTIGAL, the well-known African explorer, has been appointed German Consul in Tunis.

M. PAUL BERT was on Monday elected a Member of the Paris Academy of Sciences, in the Medical Section.

THE directors of the Crystal Palace have appointed the following twenty-one British jurymen for the International Electric Exhibition:—Capt. Abney, R.E., F.R.S., Prof. W. Grylls Adams, F.R.S., Major R. F. Armstrong, R.E., Prof. W. E. Ayrton, F.R.S., Mr. Shelford Bidwell, Sir S. Canning, Prof. R. B. Clifton, M.A., F.R.S., Mr. T. R. Crampton, C.E., Mr. Horace Darwin, Prof. G. Carey Foster, F.R.S., Prof. E. Frankland, F.R.S., Capt. Douglas Galton, C.B., F.R.S., Lieut.-Col. W. Haywood, Dr. J. Hopkinson, F.R.S., Prof. D. E. Hughes, F.R.S., Prof. Fleeming Jenkin, F.R.S., Prof. J. W. Keats, Mr. W. H. Preece, F R.S., Prof. Silvanus Thompson, B.A., D.Sc., Mr. C. E. Spagnoletti, C.E., and Lieut.-Col. Webber, R.E., president, Society of Telegraph Engineers.

THE present season seems to have been as remarkably early and open in the Arctic regions as it has been with ourselves. The captain of the French steamer *St. Germain* reports having encountered an ice-floe of vast extent during his last outward voyage across the Atlantic. During the night of February 24-5 the vessel passed through two fields of ice estimated at from two to three miles in width. On the following morning there lay in the course of the ship an immense agglomeration of masses of ice, many of which resembled the *débris* of shattered icebergs, to which no limit could be seen west, north, or south. At this time the vessel was in lat. 46° N., and long. 50° W. The ice was drifting from north to south, and for two hours the ship steamed in a southerly direction along the eastern side of the ice-floe, at full speed, without seeing any opening, its eastern face being perfectly level. Soon after eight o'clock a channel about two miles wide, and running north and south, opened out, which the captain entered, hoping to reach the open sea to the south, but after about an hour's steaming the channel narrowed into a deep strait, when he decided to continue his course slowly and push through the ice, and after three hours perilous navigation, saw open water to the west, which he at last entered in lat. 44° N., and long. 51° W., or about 120 miles to the south, and 60 miles to the west of the point at which the ice-floe was first encountered. Even then the southern limit of the floe could not be seen, although the atmosphere was exceptionally clear at the time. Another report informs us that during the latter half of March quite a hundred icebergs were seen off Cape Race.

FROM Nottingham is reported the death this week, at the age of seventy-nine years, of Mr. Sydney Smith, the inventor of the steam-pressure gauge, and many other important engineering appliances. Mr. Smith was a native of Derby, and was educated at Repton Grammar School. By the invention of the steam-pressure gauge in 1847 his name became widely known in the engineering world.

THE death is announced of Mr. William Menelaus, a gentleman well-known and highly esteemed in connection with the iron and steel industries of this country. He was in the sixty-fourth year of his age. Mr. Menelaus was past president of the Iron and Steel Institute, of which he was one of the first members. He was also the founder of the South Wales Institute of Engineers.

THE idea of conducting excavations in the Delta by means of an English fund has now assumed a practical form. The outline of operations as now prepared has received the approval, among others, of the Archbishop of Canterbury, Mr. A. W. Franks, V.P.S.A., Prof. Huxley, F.R.S., Mr. Stanley Lane Poole, the Right Hon. Sir A. H. Layard, G.C.B., Sir John Lubbock, M.P., Prof. Max Müller, Prof. Owen, C.B., Mr. Reginald Stuart Poole, Prof. Sayce, Hon. J. Villiers Stuart, M.P., Mr. W. Spottiswoode, P.R.S., Sir Erasmus Wilson, LL.D., F.R.S. At the first meeting a provisional committee was formed, with Sir Erasmus Wilson as hon. treasurer, Miss Amelia B. Edwards and Mr. Reginald Stuart Poole as hon. secretaries. The society is already in communication with M. Maspero with the object of going to work directly sufficient funds have been obtained.

A WORK of permanent value has been performed by Prof. F. W. Clarke, of Cincinnati University, in his Recalculations of the Atomic Weights, which has been published by the Smithsonian Institution as Part V. of "The Constants of Nature." Prof. Clarke concludes from his investigation that none of the seeming exceptions to Prout's Law are inexplicable. "Some of them, indeed, carefully investigated, support it strongly. In short, admitting half multiples as legitimate, it is more probable that the few apparent exceptions are due to undetected constant errors, than that the great number of close agreements should be merely accidental. I began this recalculation of the atomic weights with a strong prejudice against Prout's hypothesis, but the facts as they came before me have forced me to give it a very respectful consideration. All chemists must at least admit that the strife over it is not yet ended, and that its opponents cannot thus far claim a perfect victory."

TWO interesting discourses, delivered at a recent public *séance* of the Belgian Academy, appear in the *Bulletin* of that body. In one of them M. van Beneden makes the record of a huge whale (*Balænoptera*) captured at Ostend in 1827 (the skeleton of which was exhibited in most of the European capitals, was taken to America, and at length found a final resting-place [in St. Petersburg) the starting point for a survey of the large amount of cetological knowledge acquired since that time. In the other discourse, M. Folie laments the backwardness of his country as regards astronomy. "Modern Greece alone, indeed, can advantageously dispute with us the last place in Europe" as regards the history of that science. And it has four centuries of Mussulman tyranny for an excuse. M. Folie cites numerous facts against the view that observatories have mostly sprung out of the interests of navigation. The non-cultivation of astronomy in Belgium in the past he attributes to the country having been long without national independence and a national dynasty. Belgian astronomy only dates in reality from 1834, when the Royal Observatory was founded at Brussels. Astronomy and geodesy "are still taught throughout Belgium, as physics, botany, zoology, physiology, in a word, most of the natural sciences, were taught ten or fifteen years ago, that is, without a laboratory." And "in none of the Belgian universities, except, perhaps, Brussels, is it possible to produce an astronomer or geodesian." M. Folie looks for a speedy rectification of all this. In the outset of his lecture he notices the liberality with which the Government has lately met his proposal to annex an astronomical and geodesic institute to the University of Liège.

THE French military authorities lately announced a competition in designs for a soldier's bed. It was stipulated that the bed should be capable of being raised against the wall, and in that position present a small table at which the soldier might eat, write, &c.; the new bed should allow of utilisation of old ones; it should be as cheap as possible, and not need much repair, and it should afford no shelter to bugs (a great pest of the French army). More than a hundred models were sent in, and, after a large elimination about a dozen are on trial. Our contemporary, *La Nature*, in a notice of the more promising designs, gives final preference to a bed planned by Lieut. Bertillon. In it a piece of canvas is stretched within or slightly above a rectangular frame, by means of a rope passing through sixty-four eyelets and round an iron bar parallel with the frame, which supports it. To obviate tearing, the eyelets are encased in pieces of leather attached to the canvas. There is a simple vertical frame at the head, and the support below, at that end, consists of two bars, bent into a shape like that of the lower half of a broad capital D, the vertical part having a board attached, which serves as a table when the bed is tilted up on the curved bars against the wall (an easy operation). The support at the other end is a two-legged stool or short form, on which the soldier can sit at the table. The arrangement seems very convenient and suitable to the object proposed.

SIGNOR SELLA (son of the ex-Minister of Italy) ascended the Matterhorn on the 17th ult. with three guides, from the Italian side, and descended at Zermatt. No greater difficulties were encountered than are usually met with in summer.

SHOCKS of earthquake are reported from Ljubinge (Herzegovina) on March 25, at 6.2 p.m., lasting three seconds; and from Trebinje and Bilek on the same day, at 6 p.m., direction west to east.

OUR Paris correspondent inspected a few days ago, at Feil's workshop, the large flint-glass disk which has been cast for the Lick Observatory in California, and purchased by the trustees for 2000*l*. It is now on its way to Clarke's for polishing. Its diameter is 97 centimetres, its thickness 55 centim., its weight 170 kilog. The casting took place in four days, during which eight tons of coals were consumed. The cooling took thirty days. On the optical tests being made the glass was found perfect in all its parts. The crown-glass disk has been cast and is cooling.

THE Easter excursion of the Geologists' Association this year is to Battle and Hastings, and will extend over Monday and Tuesday, April 10 and 11.

THE seventh annual meeting of the Members of the Sunday Society was held on Friday, March 31, at its rooms, 9 Conduit Street, Mr. Hodgson Pratt presiding. The annual report, which was read by the Hon. Sec., Mr. Mark H. Judge, referred to the work of the Society having been pursued with unabated vigour during the presidency of Mr. Thomas Burt, M.P., and to the growth of public opinion in favour of its objects, and said: "The conviction is evidently gaining ground that the Government cannot much longer delay the extension of its Sunday opening policy to the national museums and galleries in the heart of the metropolis; for since 1854, when the Committee of the House of Commons recommended the opening of places of rational recreation and instruction after the hour of 2 o'clock p.m., both Liberal and Conservative Governments have continued to open on Sundays, the national museums at Kew, Hampton Court, Greenwich, and Dublin, with such results as have not only satisfied Her Majesty's Government, but have had the effect of inducing the Corporations of Birmingham, Manchester and other large towns in the provinces, to open municipal institutions of a similar kind on Sundays. The Sunday Art Exhibitions instituted by the Society had been continued and were being imitated both in London and the provinces. The Right Hon. Viscount Powerscourt, K.P., was unanimously elected president of the Society."

ON Saturday afternoon a meeting of the Essex Field Club took place at the Natural History Museum, South Kensington, on the kind invitation of Prof. Richard Owen, F.R.S., who conducted the members through the Palæontological Galleries, and gave most interesting demonstrations of many of the more remarkable fossils. Dr. Henry Woodward and Prof. Morris were also present, and did all in their power to interest the visitors. Afterwards the Club adjourned to the Exhibition Galleries, Cromwell Road, where General Pitt-Rivers, F.R.S., gave a demonstration of portions of his Anthropological Museum, particularly dwelling upon the developmental ideas underlying the inception and arrangement of that unique collection. The two meetings were entirely successful, considerably over 100 Members and friends being present.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Miss Richards; two Common Marmosets (*Hapale jacchus*) from Brazil, a Silky Hangnest (*Amblyrhampus holosericeus*) from Buenos Ayres, presented by Mr. George Jacobs; a Puffin (*Fratercula arctica*), British, presented by Miss Lane; a Smooth Snake (*Coronella lævis*), British, presented by Mr. Wm. Penney; twenty-five Madeira Snails (*Helix maderensis*), four Undated Snails (*Helix undata*) from Madeira, presented by Mr. George French Angas, C.M.Z.S.; a Diana Monkey (*Cercopithecus diana* ♂), a Talapin Monkey (*Cercopithecus talapin* ♀), a Water Chevrotain (*Hyomoschus aquaticus*) from West Africa, two Green-billed Toucans (*Ramphastos dicolorus*) from Guiana, a Yellow-lored Amazon (*Chrysotis xantholora*) from Central America, two Maguari Storks (*Dissura maguari*), an Orinoco Goose (*Chenalopex jubata*) from South America, a Common Night Heron (*Nycticorax griseus*), European, a —— Monitor (*Monitor*, sp. inc.) from Africa, purchased; two Little Bustards (*Tetrax campestris*), European, deposited; a Radiated Fruit Cuckoo (*Carpococcyx radiatus*, from Sumatra, received on approval.

OUR ASTRONOMICAL COLUMN

COMET 1882 *a*.—The following elements of the comet discovered in America on March 18, have been calculated by Mr. Hind from observations on March 19, 22, and 25, the first telegraphed from America, the two others made at the Observatory of Kiel:—

Perihelion passage 1882, June 12·07195 G.M.T.

		°	′	″	
Longitude of Perihelion	... ...	52	6	31	App. Eq.
,, ascending node	...	204	59	31	Mar. 22.
Inclination	... ...	73	42	44	
Log. perihelion distance	... ...	8·870371			

The heliocentric arc described between the extreme observations is only 33′, and the orbit is therefore to be regarded as a first approximation. Another orbit calculated by Dr. Oppenheim from observations on March 19, 23, and 27, gives the epoch of perihelion-passage, June 16·5818 G.M.T., and the log. least distance 9·07186. It is evident, therefore, that the comet will greatly increase in brightness as it draws near to the sun, and we may look for a naked-eye object a fortnight or so before perihelion. The elements, however, will not be well determined in this case, without a much wider extent of observation.

Dr. Oppenheim finds the following places for Berlin midnight. We are indebted for them to Prof. Krueger, the editor of the *Astronomische Nachrichten*:—

		R.A.				Decl.			Log. distance from Earth.
		h.	m.	s.		°	′		
April 6	...	18	28	53	...	+44	43·4	...	0·2500
7	...	—	31	14	...	45	29·4		
8	...	—	33	41	...	46	16·2		
9	...	—	36	13	...	47	3·9		
10	...	—	38	50	...	47	52·5	...	0·2323
11	...	—	41	32	...	48	42·0		
12	...	—	44	21	...	49	32·4		
13	...	—	47	16	...	50	23·6		
14	...	—	50	19	...	+51	15·7	...	0·2134

The mean of the above perihelion-distances is less than a tenth of the mean distance of the earth from the sun, and comparatively few comets out of the number calculated have approached the sun so closely; indeed, between the commencement of the seventeenth century and the present time we find only nine or ten cases that can be relied upon, in upwards of two hundred and twenty which have been computed.

VARIABLE STARS.—Amongst the objects of this class now in a favourable position for observation is one observed on the meridian at Bonn in May, 1864, and rated 9·0; its position for 1855·0 is in R.A. 13h. 22m. 58·1s., N.P.D. 98° 48′ 54″. It was 8·5 on April 16, 1855, 9·5 on April 30, 1853, and is entered 10m. on Chacornac's Chart, No. 41; on one occasion previous to 1853, it had been noted 8m. On April 5, 1874, it was a faint 9m. It was not observed either by Lalande or Bessel. It is 9m. on Bremicker's chart of the Berlin series. An eighth-magnitude (Santini calls it a sixth) follows about 10′ to the south.

Mira Ceti attains a maximum on May 23. A minimum of S Cancri occurs on April 14, at 9h. 9m. G.M.T.

GEOGRAPHICAL NOTES

THE following papers will be read at the German "Geographentag" which will meet at Halle on April 11–14:—On some scientific results of the voyage of the *Gazelle*, particularly from a zoogeographical point of view, by Prof. Studer (Berne); on the progress of our knowledge of Sumatra, by Prof. Kan (Amsterdam); on the alleged influence of the earth's rotation upon the formation of river-beds, by Prof. Zöppritz (Königsberg); on the colonies of Germans and their neighbours in Western Europe, by Herr Meitzen (Berlin); on the historical development of geographical instruction, by Dr. Kropatschek (Brandenburg); on the treatment of subjects relating to conveyance in geographical instruction, by Prof. Paulitschke (Vienna); on the introduction of metrical measures in geographical instruction, by Prof. Wagner (Göttingen); on the relation between anthropology and ethnology, by Prof. Gerland (Strassburg); on the ethnological conditions of Northern Africa, by Dr. Nachtigal (Berlin); on the Polar question, by Prof. Neumayer (Hamburg); on the geographical distribution of Alpine lakes, by Prof. Credner (Greifswald); on the true definition of the development of coasts, by Prof. Günther (Ansbach); on geographical instruction in its relation to natural sciences, by Prof. Schwalbe (Berlin); on the Guldberg-Mohn theory of horizontal air currents, by Prof. Overbeck (Halle); on the systematic furtherance of the scientific topography of Germany, by Herr Lehmann (Halle). The meeting will be combined with a geographical exhibition.

WITH the sixth part of the volume for 1881 of the *Zeitschrift* of the Berlin Geographical Society we have the usual exhaustive Catalogue of geographical literature for the year, including works and papers in all departments of geography, systematically arranged, and covering about 150 pages. No such complete list is to be found anywhere else. Dr. Konrad Ganzenmüller has a paper in this number on the Climate, Flora, and Fauna of the Central Range of the North-West Himalayas. The first part of the *Zeitschrift* for the present year contains papers by Dr. Theo. Fischer, on the Italian Sea-Chart and Maps of the Middle Ages; on the Sierra of Cordoba, by Dr. Wien; on the Antarctic Flora compared with the Palæozoic, by Dr. Joh. Palacky; and on the Cartography of Bolivia, by Dr. R. Kiepert. No. 2 of the *Verhandlungen* of the Society for 1882 contains a long lecture by Herr Buchner on his three years' exploration in South-West Africa.

THE March number of *Petermann's Mittheilungen* contains an account, by Mr. Knipping, of a recent journey through the central mountainous part of the chief island of Japan; a paper on Capt. Gallieni's mission to the Upper Niger, 1880-81; an analysis, by Prof. Zöppritz, of Mr. Stanley's thermo-barometric observations on his journey across Africa; and a necrology for the year 1881.

THERE have been several books recently published on Manitoba, to which, at present, there is a great rush of emigrants. As a rule, such books give only the bright side of the emigrant's life and prospects in the colony, and it is difficult to get a perfectly trustworthy account of what the emigrant may expect. Two Manitoba books are before us: one by the Rev. Prof. Bryce, of Manitoba College—for education has been well provided for in Winnipeg already—is mainly historical, giving pretty full details of the Earl of Selkirk's attempts at settlement. Messrs. S. Low and Co. are the publishers. The other modest